

**ABSTRACT**

The present invention is directed to reporter molecules and tags that may be used to monitor a target substance in a biological system. More particularly, the present invention relates to the use of an apo metal binding protein as a reporter molecule or tag. An apo metal binding protein may be bound to a protein or tissue or introduced into a cell. The invention also relates to methods of utilizing the apo metal binding protein for detecting a cell expressing a protein of interest, localizing a protein in a cell, and designing a therapeutic agent for treating a disease or infection.

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